Name: Date:

Polynomial Factoring solution (version 662)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 60 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(60)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 240}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-96}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{12 \pm 4\sqrt{6}\, i}{2}$$

$$x = 6 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 - 5i$ and $-3 + 9i$ in standard form $(a + bi)$.**

Solution

$$(-6 - 5i) \cdot (-3 + 9i)$$

$$18 - 54i + 15i - 45i^2$$

$$18 - 54i + 15i + 45$$

$$18 + 45 - 54i + 15i$$

$$63 - 39i$$

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3. **Write function $f(x) = x^3 + 5x^2 + 2x - 8$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	5	2	-8
1		1	6	8
	1	6	8	0

$$f(x) = (x-1)(x^2+6x+8)$$

$$f(x) = (x-1)(x+4)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+8)\cdot(x+5)^2\cdot(x+2)^2\cdot(x-1)$$

Sketch a graph of polynomial $y = p(x)$.